

Jockey's Ridge State Park

General Management Plan



GENERAL MANAGEMENT PLAN
FOR
JOCKEY'S RIDGE STATE PARK

Department of Environment, Health, and Natural Resources

Division of Parks and Recreation

Planning and Development Section

October, 1993

INTRODUCTION

Planning is an essential element of effective and efficient park administration and management. The North Carolina General Assembly acknowledged its importance by passing state parks system legislation that includes planning requirements.

The 1987 State Parks Act (G.S.114-44.7 through 114-44.14) stipulates that a State Parks System Plan be prepared. Such a plan was completed in December 1988. It evaluated the statewide significance of parks, identified duplications and deficiencies in the system, described the resources of the system, proposed solutions to problems, described anticipated trends, and recommended means and methods to accommodate trends.

The State Parks Act also requires each park to have an individual general management plan. The general management plans are required to:

...include a statement of purpose for the park based upon its relationship to the System Plan and its classification. An analysis of the major resources and facilities on hand to achieve those purposes shall be completed along with a statement of management direction. The general management plan shall be revised as necessary to comply with the System Plan and to achieve the purpose of the [State Parks Act].

The general management plan (GMP) is to be a comprehensive five-year plan of management for a park unit. GMP's function to:

1. describe park resources and facilities;
2. state the purpose and importance of each park unit;
3. outline interpretive themes and propose locations for informational and interpretive facilities;
4. analyze park and recreation demands and trends in the park's service area;
5. summarize the primary laws guiding park operations;
6. identify internal and external threats to park natural and cultural resources, and propose appropriate responses;
7. identify and set priorities for capital improvement needs;
8. analyze visitor services and propose efficient, effective, and appropriate means of responding to visitor needs; and
9. review park operations and identify actions to support efficient and effective park administrative procedures.

The GMP for Jockey's Ridge State Park, developed with public involvement, is intended to serve these purposes.


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I. DESCRIPTION OF JOCKEY'S RIDGE STATE PARK

LOCATION

Jockey's Ridge State Park is located in northeastern Dare County on Bodie Island, a barrier island that is a part of the North Carolina "Outer Banks." The park is located at milepost 12, between the U.S. 158 bypass and Roanoke Sound, within the corporate limits of the town of Nags Head.

LAND BASE

Jockey's Ridge State Park consists of 414 acres. Jockey's Ridge is the tallest natural sand dune system in the Eastern United States. Its height varies from 110 to 140 feet, depending on weather conditions. Shifting maritime winds blow the sand in varying directions, constantly changing both the shape and size of the dune.

In the winter, the winds usually blow out of the northeast and in the summer out of the southwest, therefore constantly blowing the sand back and forth rather than blowing it away. Jockey's Ridge is an example of a medano, a huge, asymmetrical, shifting hill of sand that lacks vegetation.

Even though shifting sands provide a somewhat less-than-inviting environment, several plant communities are present in the park. Small pockets of American beachgrass grow along the base of the dune. Thickets of wax myrtle, bayberry, red cedar, live oak and red bay are found in protected areas near the parking lot. A small shrub forest of southern red oaks, hickories, sweet gum and loblolly may be found to the west of the dune.

The shrub forest gives way to brackish marshes along Roanoke Sound, the western boundary of the park. Cattails, sawgrass, duck potato and a variety of sedges dominate the upper freshwater marsh, while closer to the open water black needlerush and giant cordgrass give way to scattered clumps of saltmarsh cordgrass and other species more tolerant of high salt concentration.

VISITOR FACILITIES

Visitor use at Jockey's Ridge focuses on the enjoyment of the dunes. Climbing and playing on the dune abound. Hang gliding, which is operated by a concessionaire, and kite flying are popular activities. Hikes to the top result in spectacular views of

coastal North Carolina. The nature of the shifting sand prevents the construction of traditional trails in the park, but a 1.5-mile self-guiding trail that leads through the many park environments exists.

Park facilities are clustered primarily at the 270-car parking area. A nearby picnic area contains eight shelters, each with two picnic tables and a grill. Drinking water, drink machines, and restrooms are nearby. A small park office and museum are located on the opposite side of the parking area from the picnic area.

An estuarine access with a 23-car parking area also exists along Roanoke Sound. The access is managed by the town of Nags Head under a memorandum of agreement with the Division of Parks and Recreation. The town manages the access area, including opening and closing the access and picking up the trash. Swimmers and windsurfers frequently use the area.

HISTORY OF THE PARK AREA

The history of Jockey's Ridge spans four centuries. Long before the first European settlers, the Algonquian Indians inhabited the Outer Banks. Evidence indicates that the Indians may have had semi-permanent settlements, using the Barrier Islands for seasonal use. Archaeological surveys on and around the ridge have produced no artifacts. Park staff, however, have found a few arrowheads on park property.

From the early sighting by Spanish and French explorers, the ridge has been a landmark to mariners. One of the first historical references to the ridge is found in a grant dated 1753, in which it was referred to as "Jackeys Ridge."

In the early 1800s, this remote coastal area began to develop as a summer resort. As it did, the ridge became an increasingly popular excursion for visitors and residents. The area continued to grow as a resort community, and by 1838 there was a need in the area for a public house to provide entertainment and lodging for visitors. A hotel that could accommodate 200 guests was built among the larger dunes, halfway between Roanoke Sound and the Atlantic Ocean.

Although the only practical means of travel to and from Nags Head was by boat, the community continued to grow as a resort. By the mid-1800s, Nags Head, with its big hotel, featured name bands and was frequented by notable visitors.

Development slowed during and after the Civil War. In early 1862 the Confederate Army moved into Nags Head, taking over the hotel as command headquarters. When Nags Head fell, the hotel was set ablaze by the retreating Confederates so as to render it useless to the enemy.

After the war, a new hotel was built, and at first it appeared that Nags Head would once again become a popular family resort; but this brief period of revival succumbed to the post-war reconstruction and depression, and by 1890 there were hardly any remains of the once-flourishing resort.

By the turn of the century, "Old Nags Head" had been replaced by a new community on the ocean side. The dwellings that had not been destroyed by fire were eventually consumed by the massive shifting sand dunes of Jockey's Ridge. There were as yet no bridges to the mainland, so tourists still had to travel by water.

The economic impact of early bridge construction efforts was lessened due to the Great Depression; but by the 1940s, new hotels and tourist cottages at Nags Head were successful, lot sales had increased, and attendance at "The Lost Colony" outdoor drama and the Wright Memorial were at an all-time high. Economic growth ceased, however, as the United States was drawn into World War II.

Beach development potential, enhanced by the opening of bridges and other facilities, had been held back first by economic depression and then by war. Shortly after the end of World War II, new hotels, motels, restaurants, stores and cottages began to open, real estate development increased, and tourism was on the rise.

In 1952, through private donations and state appropriations, Cape Hatteras National Seashore was established. Shortly thereafter, a series of bridges was constructed: one crossed the Croatan Sound, built in 1957; another crossed the Alligator River in 1961; and in 1963, a bridge across Oregon Inlet was completed, making nearly the entire length of the National Seashore easily accessible by motor vehicle.

Since then, Nags Head has experienced a phenomenal surge in both residential and commercial construction. Development of the area immediately surrounding Jockey's Ridge became a part of the new development.

Although the ridge was actually owned by private landowners, it was generally considered part of the public domain. Vacationers and beach residents continued to enjoy the ridge. The N.C. Department of Transportation had even constructed a 30-space roadside pull-off along the by-pass in order to provide access to the dune.

The ridge has been used for a variety of recreational activities. In addition to the traditional climbing to the summit, sightseeing and playing in the sand, the ridge has also been used for such varied activities as jeep races, parachuting, model-plane and kite flying, and hang gliding.

In the summer of 1973, Carolista and Walter Baum awoke to the sounds of heavy machinery. They investigated and learned that Jockey's Ridge was being flattened in preparation for residential

development. For years, local groups had talked of protecting the large dune from encroaching development, but no appreciable steps had been taken. This destruction, however, thrust the Baums into action. Carolista Baum planted herself in the path of the bulldozer, forcing the operator to shut the equipment down.

From that point on, the effort to "Save Our Sand Dune" took on new determination. "People to Preserve Jockey's Ridge" was organized; appeals were made to local and state governments; a petition was presented to government officials; and the Division of Parks and Recreation was asked to study the feasibility of making Jockey's Ridge a state park.

In 1973, the Division of Parks and Recreation issued a report in favor of the park, and a year later the dune was declared a National Natural Landmark. In 1975, the General Assembly appropriated funds to create Jockey's Ridge State Park. With this money and matching federal funds, the state purchased 152 acres. Additional acreage has since been acquired, some with assistance from The Nature Conservancy and some with state appropriations. The park currently contains 414 acres.

II. PARK PURPOSES

MISSION STATEMENT FOR THE STATE PARKS SYSTEM

The North Carolina state parks system exists for the enjoyment, education, health, and inspiration of all our citizens and visitors. The mission of the state parks system is to conserve and protect representative examples of the natural beauty, ecological features and recreation resources of statewide significance; to provide outdoor recreation opportunities in a safe and healthy environment; and to provide environmental education opportunities that promote stewardship of the state's natural heritage.

JOCKEY'S RIDGE STATE PARK PURPOSE STATEMENT

Jockey's Ridge State Park was established in 1975 in response to the efforts of local citizens concerned with protecting the unique scenic and geologic values of the dunes that were threatened by imminent development. Their efforts brought statewide attention to the area's protection needs. As a result, land for the park was purchased through local donations, donations from The Nature Conservancy, federal matching funds, and state appropriations.

Jockey's Ridge State Park has become a well-known source of local pride and identity in the Nags Head area. The park marks the eastern extent of the state parks system and provides an outstanding opportunity to promote pride in and understanding of the natural heritage of North Carolina.

Significant geologic values of the park include the tallest active dune along the Atlantic coast of the United States. The dune system is an excellent example of a medano, a large isolated hill of sand, asymmetrical in profile and lacking vegetation. It is also classified as a transverse dune, a dune forming a wave-like ridge transverse to the prevailing wind direction. The park functions to protect the dynamic process that has preserved this migrating dune system. Jockey's Ridge, along with the adjoining Nags Head Woods, was designated as a National Natural Landmark by the U.S. Department of Interior in 1974.

The park is noted for its significant scenic resources. The dune is an extremely impressive land form on the landscape. Visitors are attracted to its top where they can look out over miles of ocean, the towns of Nags Head and Kill Devil Hills, the Wright Brothers Memorial, and watch ships at sea. People are drawn to the sublime view of the sun setting over the mainland, its golden hues reflected in Roanoke Sound.

Park visitors delight in the recreational opportunity to roam freely over and play on the sand and dunes; they run, roam, romp, slide, and play simply for the child-like joy of it. The large, easily accessible area and prevailing ocean breezes provide a basic resource for many kinds of compatible recreation.

As a natural resource, the park provides an important and increasingly limited habitat for native plants and animals. The four plant communities present include dune grass, maritime shrub, maritime evergreen forest, and brackish marsh. Jockey's Ridge State Park is an important resource for interpretive and environmental education activities concerning the adaptation of plant and animal species to the harsh coastal environment.

Jockey's Ridge was authorized as a state park in order to provide high quality management of its valuable geologic, scenic, recreational, and biological values. The Division of Parks and Recreation is charged with preserving these values and providing park experiences that promote pride in and understanding of the state of North Carolina.

III. SUMMARY OF INTERPRETIVE THEMES

The 1987 State Parks Act defines the purposes of the state parks system. It establishes that:

The State of North Carolina offers unique archaeologic, geologic, biologic, scenic and recreational resources. These resources are part of the heritage of the people of this State. The heritage of a people should be preserved and managed by those people for their use and for the use of their visitors and descendants.

It further provides that:

Park lands are to be used by the people of this State and their visitors in order to promote understanding of and pride in the natural heritage of this State.

One of the best methods of meeting these purposes is through environmental education. The Department of Environment, Health, and Natural Resources has adopted the following definition of environmental education:

Environmental education is a process that increases awareness, knowledge, and understanding of natural systems -- the interdependence of living things, the impact of human activities -- and results in informed decisions, responsible behavior, and constructive action.

PRIMARY INTERPRETIVE THEMES

SAND DUNES

This interpretive theme focuses on the dynamics, movement, and formation of the sand dunes. It also concerns the plant and animal adaptations to the dune environment and the cultural history of the dune area. In addition, it focuses on what sand is.

DIVERSITY OF HABITATS

This interpretive theme focuses on the plants and animals in the area, how they have created niches for each other, and how they modify sand movement. It also concerns how the plants and animals have adapted to the environment.

SECONDARY INTERPRETIVE THEMES

Several secondary themes for Jockey's Ridge State Park have also been identified. They are:

- Wild edibles
- Early settlers' use of the area and plants
- Conservation ethic
- Animals - fox, animal signs
- Birds - especially of the sound and salt marsh
- Night sensory programs and astronomy
- Seining and shallow water marine animals
- Park history

IV. PARK AND RECREATION

DEMAND AND TRENDS

ANNUAL VISITATION TRENDS

Jockey's Ridge State Park's annual visitation has been increasing at a pace that has generally been far faster than most state park units. Visitation has more than tripled during the last ten years, rising from 187,784 in 1981 to 656,212 in 1991, an all-time high. (Figure IV-1)

Visitation figures are taken from a traffic counter located in the park. Jockey's Ridge also receives a substantial amount of walk-in traffic that is estimated and included in the visitation figures. Visitors often park across the US 158 Bypass and other locations outside the park and walk to the ridge. Walk-in visitors also come from the nearby North Ridge and Soundside Road areas. The park superintendent estimates that the walk-in visitation is 40 percent of the visitation recorded by traffic counters.

Annual visitation at Jockey's Ridge is expected to continue to increase. The Outer Banks area continues to grow in popularity, both in terms of year-round population and as a beach resort. Jockey's Ridge is an easily recognized landmark, and visitors to Nags Head that drive on the by-pass are naturally attracted to the ridge and the flurry of activity usually associated with it.

The soundside estuarine access area opened in March of 1992. Preliminary visitation counts indicate that the access area will receive visitation of approximately 75,000 annually.

Being located in close proximity to the Wright Brothers Memorial and Cape Hatteras National Seashore also helps boost visitation at Jockey's Ridge. Annual visitation at the nearby Wright Memorial has been flat over the past three years, varying between 464,000 and 475,000 visits annually. The Cape Hatteras National Seashore has also had flat visitation during the past three years, fluctuating between 2,200,000 and 2,228,000 visits.

MONTHLY VISITATION TRENDS

As can be expected, Jockey's Ridge State Park receives the bulk of its visitation during the warm months when general beach activity is up. During the five months from May through September, Jockey's Ridge will receive approximately 76 percent of its annual visitation. Figure IV-2 shows the average monthly visitation for the four-year period from August of 1987 through July of 1991. The Wright Memorial also has a similar monthly visitation. In 1991, visitation at the National Park Service facility varied from a low of 4,800 in January to a high of 92,900 in August.

JOCKEY'S RIDGE STATE PARK VISITATION

1979- 1991

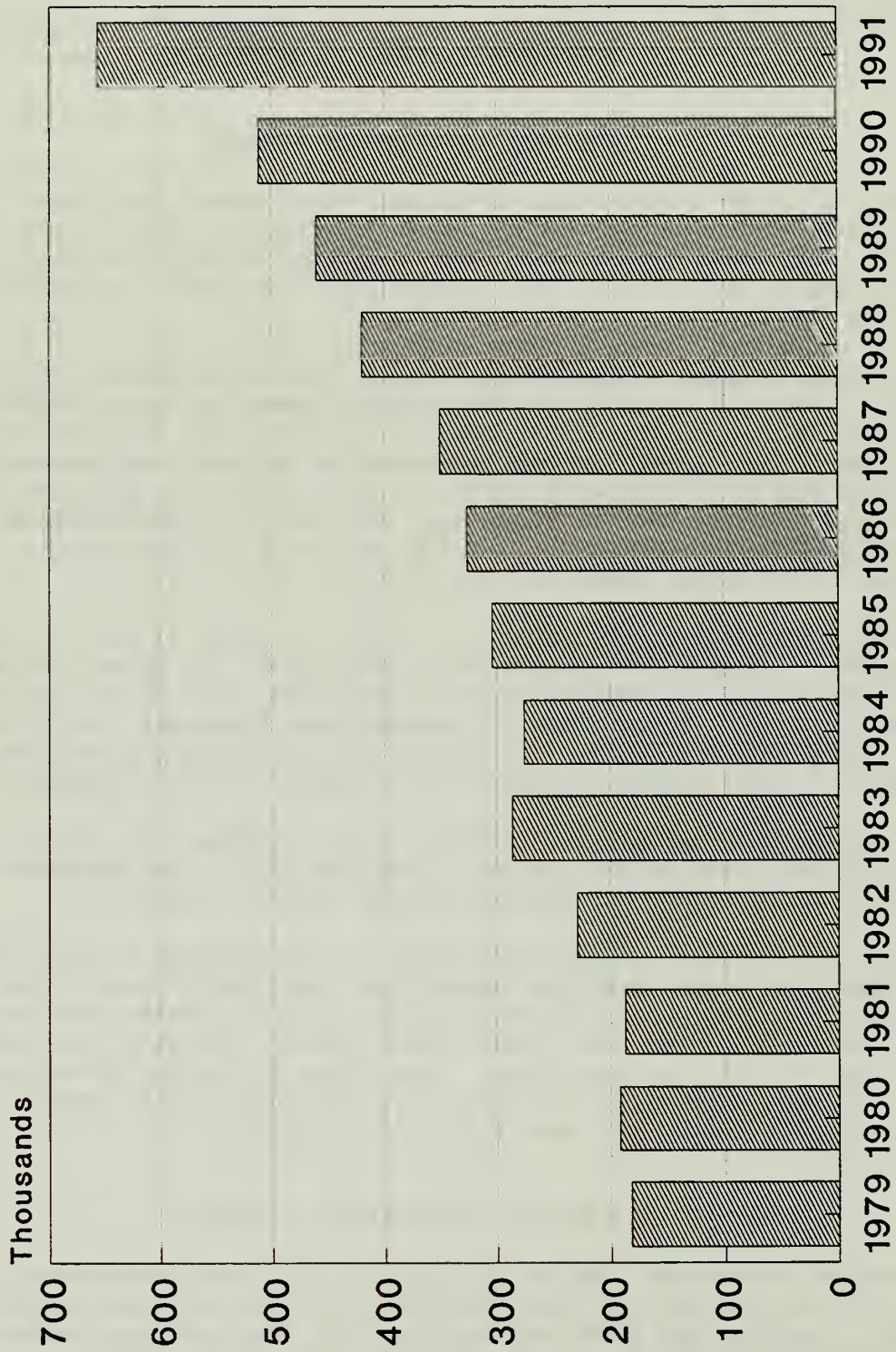


Figure IV-1. Jockey's Ridge Annual Visits

JOCKEY'S RIDGE AVERAGE MONTHLY VISITS

AUGUST 1987- JULY 1991



Figure IV-2. Average Monthly Visitation

Visitation at the park is recorded daily. Unlike many state parks, Jockey's Ridge gets heavier use on weekdays rather than weekends. This pattern exists because the weekends are normally used by tourists and vacationers for travelling to and from the beach. Tuesdays, Wednesdays, and Thursdays are the days with the highest visitation in June, July and August.

ACTIVITY TRENDS

Use of the dunes for hang-gliding has increased since development of the park's master plan in 1976. Complete records are not available, but it appears that the biggest increases in use have come from the concessionaire's training efforts. In 1974, 4000 students were taught; in 1985, the number of students had increased to 8,300; and in 1991, 11,500 students received training.

Figures are available since 1988 for individual (nonconcessionaire-related) use of the dunes for hang-gliding. Such use has been relatively flat, averaging approximately 960 persons annually. Private users are required to sign in at the park office prior to flying.

String kite flying at Jockey's Ridge has increased substantially during the past ten years. No use figures are available for this activity, however.

Jockey's Ridge staff have received numerous requests for non-traditional recreational uses of the park. Requests have been received, primarily from the hang-gliding concessionaire, to include paragliding in the lesson packages. The Outer Banks Sandboarding Association, composed of approximately 25 local teenagers, would like to use the ridge for sandboarding. Sandboarding requests have also been received from other park visitors. Motorized model plane fliers have requested areas for their activities. Martial arts clubs have submitted special activity requests for use of the ridge. Other assorted special activity requests -- for weddings, religious services, filming of music videos and TV commercials, photography, etc. -- are also routinely received.

Special activity requests such as the above have expanded both in frequency and type over the years. Sandboarding will be allowed during the winter of 1992 on a trial basis, and a decision on whether or not to permit paragliding will be made soon. Some activities, such as motorized model airplane flying, must be denied because of public safety concerns.

INTERPRETATION AND EDUCATION TRENDS

Jockey's Ridge State Park staff have done an excellent job of providing interpretation and education programming with limited staffing and resources. During the summers of 1990 and 1991, the

majority of nature programming was conducted by three to four volunteers, with park rangers training, scheduling and supervising the volunteers. Rangers also conducted some summer programs. Rangers provide 40 to 50 programs annually during April and May to school and other groups. More such programs could be scheduled, but because of staffing shortages, many requests must be denied.

From 1985 to 1989, the state government internship program was used to provide a summer park naturalist. The position enabled programs to be presented which otherwise would have been unavailable. Unfortunately, temporary staffing from this source has not been available since 1989.

The following table shows the attendance and number of programs offered at Jockey's Ridge since 1984. The table shows substantial growth both in attendance and number of programs offered. It should be remembered, however, that such growth has taken place despite staffing limitations, and that with increased staffing, interpretation and education activities could be expanded.

Table IV-1. Interpretation and Education Trends

Year	Attendance	Number of Programs
1991	19,188	260
1990	17,659	194
1989	8,505	105
1988	8,262	102
1987	2,578	64
1986	1,587	not available
1985	1,182	not available
1984	645	not available

US 158 BYPASS VEHICLE COUNTS

The N.C. Department of Transportation has two vehicle count stations located near Jockey's Ridge on the US 158 Bypass. One station is located north of Jockey's Ridge and just south of the Wright Memorial. The other station is located south of Nags Head, just north of the turn-off for the Roanoke Sound bridge.

A review of the 10-year history of these two stations reveals that

the average daily vehicle traffic has doubled at the station near the Roanoke Sound bridge and has roughly tripled near the Wright Memorial. As Figure IV-3 shows, the growth in average daily vehicle traffic near the Wright Memorial follows the same general pattern of growth as visitation at Jockey's Ridge. As the Outer Banks area continues to grow, traffic volume and visitation should continue this pattern.

STATE PARK SYSTEM VISITOR INFORMATION

In 1987 the U.S.D.A. Forest Service was contracted by the Department to conduct a Park Areas Recreation Visitors Survey (PARVS) of the North Carolina state parks system visitors in order to identify their socio-economic characteristics and economic contribution to the state's economy. While Jockey's Ridge was not one of the eight parks involved in the survey, some information concerning state park visitors in general was learned.

Why do people visit state park units? The convenient location was cited by 31 percent of the respondents; 25 percent thought other areas were too crowded; 21 percent liked the good facilities; 8 percent wanted to try a new area; 7 percent enjoyed the scenic beauty; and 6 percent came to see the attraction.

A good percentage of park visitors come from within a 30-mile radius (37 percent), while 17 percent come from 30 to 60 miles away. Park visitors surveyed indicated that the parks served as their sole destination 86 percent of the time. While most visitors come from nearby, the average one-way distance travelled was 139 miles.

Seventy-eight percent of those surveyed indicated that they were return visitors. The average number of return trips per year was six.

Sixty-one percent of visitors statewide came with family members, 16 percent with friends, and 7 percent with family and friends. Ten percent of visitors came alone. Visitors also came in small numbers in organized groups and multiple families. The average group size surveyed was 3.59.

PARVS data indicates that 16.8 percent of groups surveyed used more than one car, and that the average number of persons per car was 3.05. The average age of the park visitor was 38.24 years. The age distribution was as follows:

Percent of Visitors by Age Group

<u>Under 6</u>	<u>6-12</u>	<u>13-18</u>	<u>19-25</u>	<u>26-35</u>	<u>36-45</u>	<u>46-55</u>	<u>56-65</u>	<u>Over 65</u>
6.7	11.6	10.6	12.5	20.1	16.9	0.9	7.3	4.4

AVERAGE DAILY VEHICLE TRAFFIC US 158 BYPASS - WRIGHT MEMORIAL

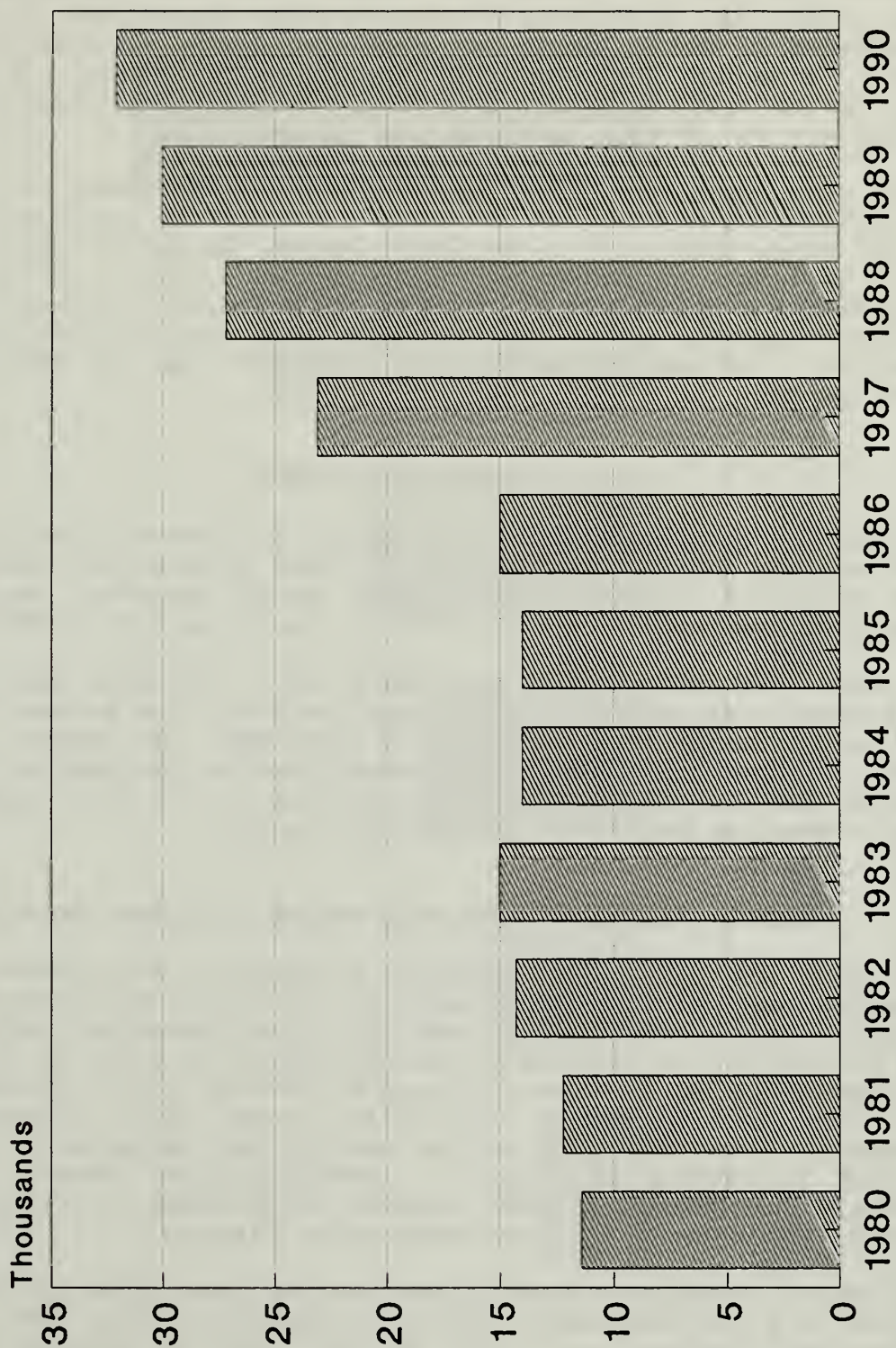


Figure IV-3. US 158 Vehicle Traffic

Because the PARVS information shown above was gathered at eight park sites, not including Jockey's Ridge State Park, it cannot be considered a valid study of Jockey's Ridge visitation. It is useful, however, in providing a general assessment of the state park system's visitation as well as a general indication of likely visitation at Jockey's Ridge.

PARVS data indicates that approximately 25 percent of state park visitation comes from out of state. Because of the heavy influx of out-of-state visitors to the Outer Banks, the percentage of out-of-state visitors at Jockey's Ridge is much higher. While no exact figures are available, park staff estimates out-of-state visitation is approximately 50 percent. PARVS data also indicates that out-of-state visitors averaged 4.1 trips per year to North Carolina state parks.

POPULATION TRENDS

Figure IV-4 shows Dare County's population growth from 1970 through 1990 and the projection for 1995. This growth has been at a rate that slightly exceeds six percent annual growth. By 1995, the county's population is projected to have reached 30,540.

The above figures reflect residency only. Because the Outer Banks is a summer-oriented tourist destination, the summer population swells far beyond the number of permanent residents. The Dare County Chamber of Commerce estimates that at the peak of the summer season, the county's population swells to 100,000, approximately four times the permanent residency figure.

OUTDOOR RECREATION PARTICIPATION IN NORTH CAROLINA

The five most popular outdoor recreation activities in North Carolina are walking for pleasure, driving for pleasure, viewing scenery, beach activities, and visiting historical sites. Three out of every four households participated in walking for pleasure at least once in the past 12 months (Table IV-2). In addition to the five most popular activities, over fifty percent of the households responding to a 1989 survey participated at least once in the following activities: swimming (in lakes, rivers, or oceans), visiting natural areas, picnicking, attending sports events, visiting zoos, and freshwater fishing.

The North Carolina Outdoor Recreation Participation Survey was mailed to 3,100 randomly selected residents in the spring of 1989. Forty-five percent, or 1,399 people, returned completed surveys. Each person receiving the survey was asked to estimate the number of times the members of his household had participated in each of 43 activities. The survey results provide good insight into the current participation of North Carolinians in a wide range of outdoor recreation activities.

DARE COUNTY POPULATION GROWTH 1970 - 1995 PERMANENT POPULATION

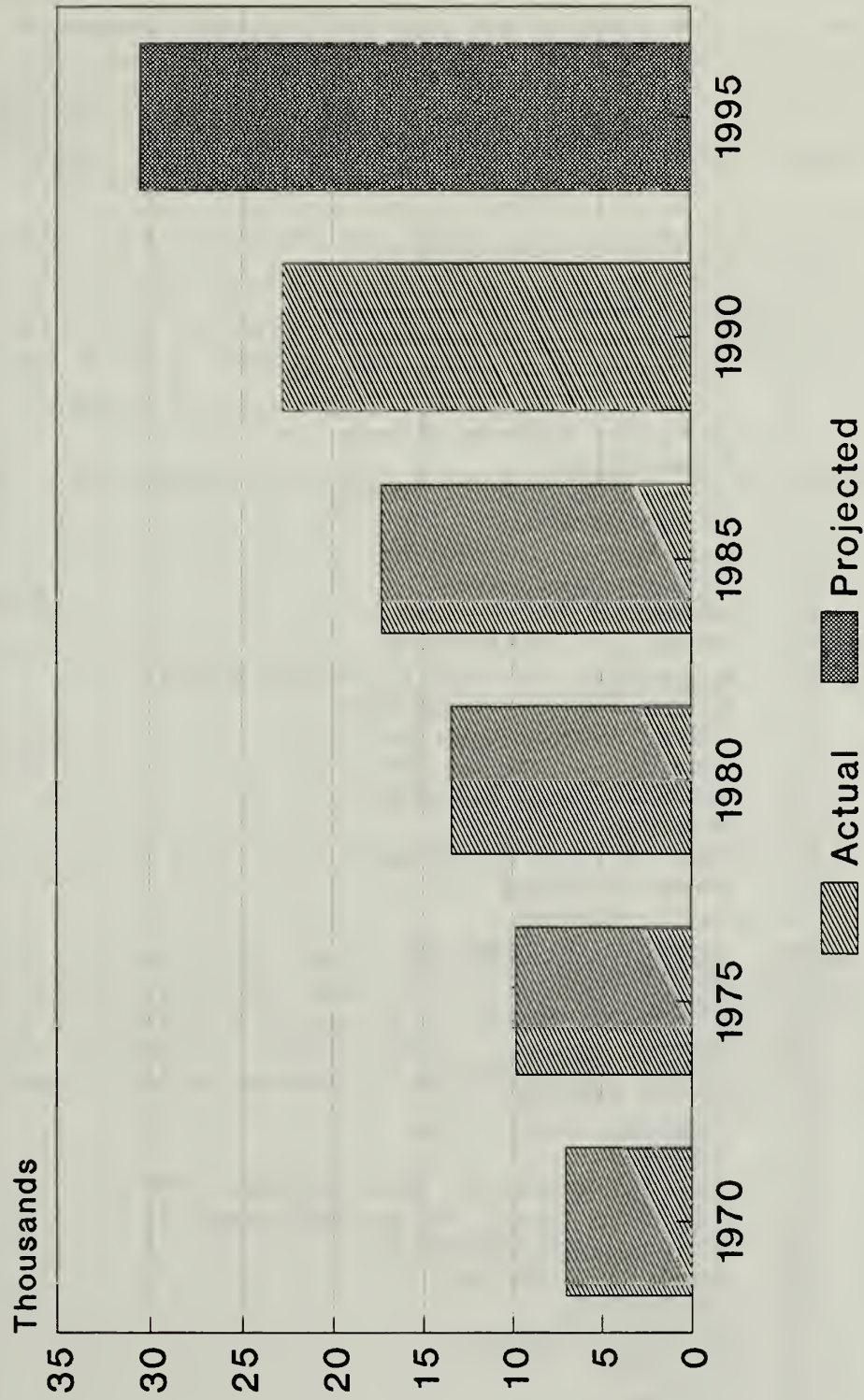


Figure IV-4. Dare County Population
Note: Peak Seasonal Population is 100,000

Table IV-2. Outdoor recreation activities ranked by popularity.

Rank	Activity	Percentage of Households Participating
1.	Walking for Pleasure	75%
2.	Driving for Pleasure	72
3.	Viewing Scenery	71
4.	Beach Activities	69
5.	Visiting Historical Sites	62
6.	Swimming (in Lakes, Rivers, and Oceans)	54
7.	Visiting Natural Areas	53
8.	Picnicking	52
9.	Attending Sports Events	52
10.	Visiting Zoos	51
11.	Fishing - Freshwater	50
12.	Use of Open Areas	41
13.	Swimming (in Pools)	40
14.	Fishing - Saltwater	38
15.	Attending Outdoor Cultural Events	35
16.	Bicycling for Pleasure	32
17.	Other Winter Sports	31
18.	Camping, Tent or Vehicle	29
19.	Softball and Baseball	28
20.	Hunting	28
21.	Use of Play Equipment	28
22.	Power Boating	26
23.	Trail Hiking	26
24.	Jogging or Running	24
25.	Basketball	24
26.	Nature Study	22
27.	Golf	22
28.	Target Shooting	20
29.	Water Skiing	19
30.	Camping, Primitive	14
31.	Tennis	14
32.	Use Motorcycles, Dirt Bikes, ATV's	13
33.	Use Four Wheel Drive Vehicles	13
34.	Canoeing and Kayaking	13
35.	Horseback Riding	12
36.	Volleyball	12
37.	Downhill Skiing	12
38.	Football	11
39.	Soccer	7
40.	Sailboating	7
41.	Skateboarding	6
42.	Cross Country Skiing	2
43.	Windsurfing	1

PRIORITIES OF PUBLIC OUTDOOR RECREATION FUNDING

The North Carolina Outdoor Recreation Survey asked residents to identify and rank their future public outdoor recreation needs. High priority needs for public outdoor recreation were determined by combining ratings for future demand and public funding priorities. Each activity received a rating of high, moderate or low for both future demand and support for public funding.

These ratings were combined to produce a score from one to nine, reflecting an overall priority for which one is the highest priority and nine is the lowest. The combined rating is produced using a matrix that assigns a higher priority to support for public funding than future demand for the outdoor recreation activity (Table IV-3).

Table IV-3. Scoring Matrix for Future Recreation Priorities

Future Demand	Public Support		
	High	Moderate	Low
High	1	3	6
Moderate	2	4	8
Low	5	7	9

Based on this analysis, many of the activities rated as high priorities are activities that are currently or could potentially be provided at Jockey's Ridge State Park. The activities include walking for pleasure, picnicking, beach activities, visiting natural areas, viewing scenery, trail hiking, and use of open areas (Table IV-4).

Table IV-4. Priorities of Future Outdoor Recreation Activities

Activity	Code
Walking for Pleasure	1
Camping, Tent or Vehicle	1
Picnicking	1
Beach Activities	1
Fishing - Freshwater	1
Attend Outdoor Cultural Events	1
Visiting Natural Areas	2
Use of Play Equipment	2
Visiting Zoos	2
Visiting Historical Sites	2
Bicycling for Pleasure	3
Swimming (in Pools)	3
Viewing Scenery	4
Hunting	4
Trail Hiking	4
Use of Open Areas	4
Target Shooting	4
Swimming (Lakes, Rivers, Ocean)	4
Fishing - Saltwater	4
Camping, Primitive	7
Driving for Pleasure	8
Horseback Riding	8
Golf	8
Attending Sports Events	8
Jogging or Running	9
Nature Study	9
Softball and Baseball	9
Basketball	9
Football	9
Soccer	9
Tennis	9
Volleyball	9
Skateboarding	9
Sailboating	9
Windsurfing	9
Canoeing and Kayaking	9
Power Boating	9
Water Skiing	9
Downhill Skiing	9
Cross Country Skiing	9
Other Winter Sports	9
Use Motorcycles, Dirt Bikes, ATV	9
Use Four-Wheel-Drive Vehicles	9

V. SUMMARY OF LAWS

GUIDING PARK MANAGEMENT

There are many federal and state statutes, state and federal executive orders, and administrative rules and policies that govern the operation of the state parks system. A thorough listing and discussion of these will be available in the Systemwide Policies Manual, which is under development.

This chapter includes a brief discussion of the primary legal basis for the existence and operation of the state parks system.

NORTH CAROLINA CONSTITUTION

Article XIV, Section 5, of the North Carolina Constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The amendment reads in part as follows:

It shall be the policy of this State to conserve and protect its lands and waters for the benefit of all its citizenry, and to this end it shall be a proper function of the State of North Carolina and its political subdivision to acquire and preserve park, recreation, and scenic areas, to control and limit the pollution of our air and water, to control excessive noise, and in every other appropriate way to preserve as a part of the common heritage of this state its forests, wetlands, estuaries, beaches, historical sites, open land, and places of beauty.

STATE LAWS

STATE PARKS ACT

The State Parks Act (G.S. 113-44.7 through 113-44.14) sets forth a mission statement for the state parks system. It states that the system functions to preserve and manage representative examples of significant biologic, geologic, scenic, archaeologic, and recreational resources, and that park lands are to be used by the people of the state and their visitors and descendants in order to promote understanding of and pride in the state's natural heritage.

The State Parks Act also calls for development and periodic revisions of a System Plan to achieve the mission and purpose of the state parks system in a reasonable, timely, and cost-efficient manner. The Act describes System Plan components and requires that

public participation be a component of plan development and revisions.

The State Parks Act also calls for the classification of park resources and development of general management plans (GMPs) for each park. GMPs are to include a statement of park purpose, an analysis of major resources and facilities, and a statement of management direction.

POWERS AND DUTIES OF THE DEPARTMENT OF ENVIRONMENT, HEALTH, AND NATURAL RESOURCES

This act authorizes the Department to make investigations of the resources of the state and to take such measures as it may deem best suited to promote the conservation and development of such resources. The Act also authorizes the Department to care for state forests and parks and other recreational areas now owned, or to be acquired by the state. (G.S. 113-8)

STATE NATURE AND HISTORIC PRESERVE DEDICATION ACT

The State Nature and Historic Preserve Dedication Act (G.S.143-260.6) was authorized by Article 14, Section 5, of the North Carolina Constitution. It seeks to ensure that lands and waters acquired and preserved for park, recreational and scenic areas for the purpose of controlling and limiting the pollution of air and water, controlling excessive noise, and in every other appropriate way preserving as a part of the common heritage of the state, continue to be used for those purposes. The State Nature and Historic Preserve therefore provides a strong legal tool for protecting lands from incompatible uses.

The addition and removal of lands to and from the State Nature and Historic Preserve require a law enacted by a vote of three-fifths of the members of each house of the General Assembly.

Over 405 of Jockey's Ridge State Park's 414 acres are in the State Nature and Historic Preserve.

NORTH CAROLINA ENVIRONMENTAL POLICY ACT OF 1971

Recognizing the profound influence that man's activity has on the natural environment, the General Assembly passed the Environmental Policy Act "to assure that an environment of high quality will be maintained for the health and well-being of all..."

The Act declares that:

It shall be the continuing policy of the State of North Carolina to conserve and protect its natural resources and to create and maintain conditions under which man and nature can exist in productive harmony. Further, it

shall be the policy of the State to seek, for all its citizens safe, healthful, productive, and aesthetically pleasing surroundings; to attain the widest possible range of beneficial uses of the environment without degradation, risk to health or safety; and to preserve the important historic and cultural elements of our common inheritance. (G.S. 113A-3)

While there are other General Statutes that concern the state parks system and the environment, the above-described statutes, along with Article XIV, Section 5, of the North Carolina Constitution, largely define the purposes of the state parks system and serve to guide the operation of state park system units.

COASTAL AREA MANAGEMENT ACT

Because of their inherent natural significance in the coastal environment, certain "areas of environmental concern" (AEC) are defined by and protected under the Coastal Area Management Act (CAMA). (G.S.113A-100 et.seq.) Development activities within an AEC require permits, obtained from the N.C. Division of Coastal management, in addition to any other required state or local permits. Areas of environmental concern defined by the act include:

- Estuarine systems: sounds, bays tidal waters, inland fishing waters, marshes and shorelines.
- Public water supply: watersheds and well fields.
- Natural and cultural resources: areas of historic, aesthetic, scientific, or biological significance.

All of Jockey's Ridge State Park lies within estuarine systems and natural and cultural resources AEC's. Questions regarding AEC regulations should be directed to the Division of Coastal Management in Elizabeth City, N.C. (919-264-3901) and to the local CAMA permit officer at the Town of Nags Head.

As a result of the cultural AEC designation by the Coastal Resources Commission, landowners within the AEC adjacent to the park are required to put sand that has accumulated on their property back in the park if they move over 10 cubic yards of sand annually. The Division of Parks and Recreation has entered into an annual contract for redepositing such sand into the park.

FEDERAL LAWS

LAND AND WATER CONSERVATION FUND ACT OF 1965

The federal Land and Water Conservation Fund Act (PL 88-578) offers protection and places restrictions on fund-assisted outdoor recreation areas.

By virtue of receiving Land and Water Conservation Fund (LWCF) grant assistance, most of the state parks system, including most of Jockey's Ridge State Park, is subject to LWCF rules and regulations. Property acquired or developed in whole or in part with LWCF assistance cannot be converted to other than public outdoor recreation use without federal approval. A conversion may only take place if approved by the secretary of the Interior, and only then if replacement property of equal fair market value and reasonably equivalent usefulness and location is made.

LWCF requirements include: programming, operating and maintaining areas in a manner that encourages public participation; maintaining the property so it appears attractive and inviting to the public; maintaining property, facilities and equipment to provide for public safety; keeping facilities, roads, trails and other improvements in reasonable repair throughout their lifetime to prevent undue deterioration and encourage public use; keeping the park and facilities open for use at reasonable hours and times; and making future development meet LWCF rules and regulations. LWCF-assisted sites are periodically inspected by state and federal inspectors to ensure compliance with LWCF requirements.

CLEAN WATER ACT

Jockey's Ridge has sensitive wetland areas that receive some protection from Section 404 of the federal Clean Water Act. The Act prohibits the discharge of dredge or fill materials into waters, including wetlands, without a permit from the U.S. Army Corps of Engineers. Activities in wetlands for which permits may be required include, but are not limited to: placement of fill material; ditching activities when excavated material is side cast; land clearing involving relocation of soil material; land leveling; most road construction; and dam construction. (33 USC 1344) The Division will avoid undertaking construction located in wetlands unless there is no practical alternative and all practical measures are taken to minimize harm to the wetland.

JOCKEY'S RIDGE MASTER PLAN

A master plan for Jockey's Ridge State Park was completed in 1976. The primary objective in preparing the master plan was to provide a development plan and program compatible with the nature of the site. The plan sought to unify development in such a way that administrative services and operations would be provided efficiently.

In addition, the master plan addressed the optimum carrying capacity of the site for all of its proposed activities and facilities with respect to the maintenance of the desired park character. The plan called for a review of the impact of site development and visitor use after each development phase to determine if further expansion was desirable, then ensuring long-range protection of the natural resource.

The master plan still serves to guide overall park development. During the general management plan process, the existing master plan was reviewed to determine if master plan proposals are still valid or if modifications are needed. The changes determined to be needed are minor and are detailed in Chapter VII.

VI. RESOURCE MANAGEMENT

NATURAL RESOURCE MANAGEMENT POLICY

The Division of Parks and Recreation's approach to natural resource management is directed by the North Carolina Constitution and the State Parks Act, both of which require the management of natural resources. The constitution sets overall policy by broadly defining the conservation and protection of natural resources and the acquisition of such resources as a proper function of government. The State Parks Act states that unique archaeological, geological, biological, scenic, and recreational resources are a part of the heritage of the people, which "...should be preserved and managed by those people for their use and for the use of their visitors and descendants."

The North Carolina State Parks System plays an important role in maintaining, rehabilitating, and perpetuating the state's natural heritage. The natural resources of the state parks system are: high quality, rare or representative examples of natural communities; native plants and animals; geological features and landforms; water resources; and the natural processes that affect these elements. The primary objective in natural resource management will be the protection of natural resources for their inherent integrity and for appropriate types of enjoyment while ensuring their availability to future generations.

It is the policy of the Division that natural resources will be managed by allowing natural environments to evolve through natural processes with minimal influence from human activities. Resource management will not attempt solely to preserve individual species or individual process; rather, it will try to maintain all the components and processes of naturally evolving ecosystems. When intervention is necessary, direct or secondary effects on park resources will be minimized to the greatest extent possible. Intervention with natural processes may occur:

- 1) to correct or compensate for the disruption of natural processes caused by human activities;
- 2) to protect, restore, or enhance rare species;
- 3) to protect, restore, or enhance significant archaeological resources;
- 4) to construct, maintain, improve, or protect park facilities; and
- 5) to prevent danger to human health and safety.

NATURAL COMMUNITIES AT JOCKEY'S RIDGE STATE PARK

Because the main feature at Jockey's Ridge State Park is its active dune system, the park's natural resources are unlike those found at other parks in the system. The dunes' size and constantly shifting sands effectively illustrate the unique and fragile nature of the Outer Banks' ecosystems and geology. But even though the dunes have an open character and move at the whim of local winds, substantial areas have been colonized and stabilized by vegetation. Several plant communities are well established and include:

Dune Grass. This community type is distinguished by the predominance of salt spray and shifting sand as the major environmental factors under natural conditions. Perennial plants (especially grasses) rather than annuals tend to dominate, but the community grades all the way to unvegetated shifting dunes. Beach grass (Ammophila breviligulata) and occasionally sea oats (Uniola paniculata) are conspicuous among the distinguishing plant species at Jockey's Ridge, but a number of other species are also prominent. Good examples of this community are found on the south end of the park.

Maritime Dry Grassland. This plant community is best represented on the sound side of the park, behind the large unvegetated sand dunes and Maritime Forest. It grades into dune grass with beach grass on higher dunes, but Maritime Dry Grassland is generally found on and between the lower dunes. One of these areas is notable because of the presence of two special plants, a large population of woolly beach heather (Hudsonia tomentosa), and a newly discovered population of maritime pinweed (Lechea maritima).

Maritime Wet Grassland. This plant community is represented in the southwestern quadrant of the park and is notable for its herbaceous diversity. It is characterized by wet sandy soils with saltmeadow cordgrass (Spartina patens), pennyworts (Hydrocotyle spp.) and many other species. Among the interesting species present in a wetter zone is a sundew (Drosera intermedia) population. The lower areas (depressions) almost grade into Maritime Swamp Shrub. With rises in elevation, Maritime Wet Grassland grades into Maritime Dry Grassland. Unfortunately, portions of this community have been disturbed in the past.

Salt Marsh. Although limited in size, there are two areas of Salt Marsh on the sound side of the park. They have previously been characterized as Brackish Marsh and do grade into that community type, but are more properly classified as Salt Marsh, because of the amount of saltmarsh cordgrass (Spartina alterniflora) and restricted fresh water dilution.

Maritime Evergreen Forest. The best example of this plant community is immediately west of the largest unvegetated dunes. As a result of this proximity, the forest is being gradually swallowed by the sand. This process is representative of the ecological

dynamics in the park, however, with the dunes providing the necessary shelter for the development of the community and also destroying the community. The community is characterized by large live oaks (Quercus virginiana), loblolly pine (Pinus taeda), and a mixture of other species. Some parts of the Maritime Shrub almost grade into Maritime Evergreen Forest and may eventually develop into the latter.

Maritime Shrub. This evergreen shrub-dominated plant community occurs on the lower stabilized dunes, in dune swales, and sand flats protected from salt water flooding and the most extreme salt spray. A large portion of the eastern end (ocean side) of the park has examples of this community, with portions almost grading into Maritime Evergreen Forest. Much of the area with this community type has been highly disturbed, very recently in some areas, making it difficult to classify as a natural community. Development around the park has also affected the natural processes and successional development. A portion next to US 158 and south of the park entrance has poorly drained soil and may grade into Maritime Swamp Shrub, but disturbance has been high in this area.

Typical species in this community include wax-myrtle or southern bayberry (Myrica cerifera), greenbrier (Smilax spp.), stunted live oak, and stunted sand laurel oak (Q. hemisphaerica). Other species of interest found in this community at Jockey's Ridge include dune prickly-pear (Opuntia pusilla = O. drummondii), woolly beach heather, and northern bayberry (M. pensylvanica).

There are many examples of disturbed areas in and around the park. These include areas around current buildings and roads, previous buildings and roads, areas where sand has been removed, and areas previously traversed by ATVs or four-wheel-drive vehicles.

NATURAL HERITAGE PROGRAM ELEMENT OCCURRENCES

Woolly Beach Heather (*Hudsonia tomentosa*). This small, yellow-flowered plant is considered Significantly Rare in North Carolina. It is found on sand dunes and openings in maritime forests in Currituck and Dare Counties. In the park, it occurs in the Maritime Dry Grassland community on the west side of the main dune.

Maritime Pinweed (*Lechea maritima*). This plant was recently discovered in the Maritime Dry Grassland community within the park. Its range includes nearby Virginia, but it was not previously known to occur in North Carolina.

Registered Natural Area. Most of the park, excluding the estuarine access area off Soundside Road and the park facility areas along US 158, is designated as a Registered Natural Heritage Area. At the time of registry, some of the land on the sound side was not included in the park, and therefore is not included in the registered area.

Overall, the existing natural area is in reasonably good condition in spite of the high visitor use. Because of the fragile nature of the dune plants, there are areas where visitor use and unauthorized abuse have disrupted vegetation and accelerated sand erosion. This is evident at the extreme south end of the park where 4-wheel-drive or ATV damage is obvious. Bollards and gates installed at the estuarine access area have helped to reduce off-road vehicle damage in that area. Areas of high pedestrian traffic also show signs of damage to the vegetation. The area used by the hang-glider concessionaire on the dunes and the area used by them for access show signs of vegetation loss and accelerated sand erosion.

Potential Additions to the Natural Area. Boundaries of the Registered Natural Area should be expanded to ensure that all of the Maritime Dry Grassland community on the sound side with the woolly beach heather and the maritime pinweed are included. In addition, the Maritime Wet Grassland community south of the above should be included in the Natural Area. The estuarine access area would remain outside of the proposed additional natural area.

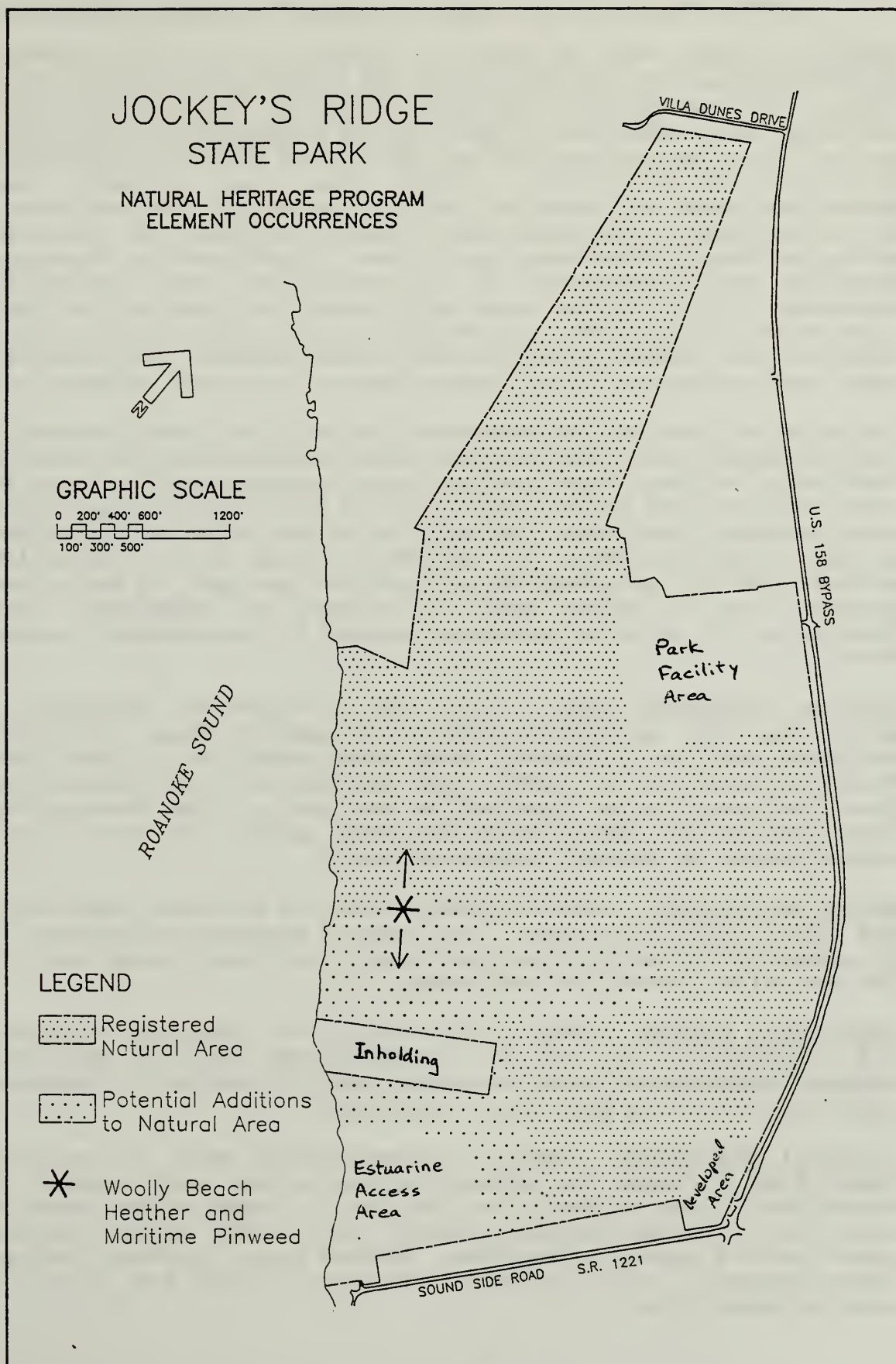


Figure VI-1. Natural Heritage Program Element Occurrences.

RESOURCE MANAGEMENT ISSUES AT JOCKEY'S RIDGE STATE PARK

Dune Migration. The direction of sand movement on Jockey's Ridge varies seasonally, depending on the direction of the prevailing winds. Net movement of the dune system is toward the south. In the long term, sand may be leaving the boundaries of the park, but is not being replenished by free sand from areas outside the park, especially to the north. Many areas that probably used to contribute sand to Jockey's Ridge are now stabilized and developed. The ecosystems in the park are extremely dynamic, yet the contributing natural processes have been significantly interrupted. Research and monitoring of the geological and meteorological processes affecting the dune would assist in planning for the long term fate of the dune. A study of the current sand relocation efforts, the deposit site and its effectiveness, and ways to slow down the movement of the forward edge of the dune should be made.

The cultural Area of Environmental Concern (AEC) designation by the Coastal Resources Commission was established to help to return some sand that is blown from the park onto neighboring lots. An annual contract has been established from the park's operating budget for sand redeposit purposes. While this action helps mitigate the loss of sand from the park, no scientific data on its effectiveness exists. While redeposition of sand in the park is not a natural process, it is being done to attempt to compensate for the disruption of natural processes caused by development around the park.

Sand on Soundside Road. Along the southeastern boundary of the park, the dune is getting close to Soundside Road. This area is included within a Coastal Area Management Act (CAMA) Area of Environmental Concern (AEC). AEC regulations require sand removed from the road to be returned to the park. The feasibility and desirability of stabilizing the sand along the road should be investigated by Natural Resources staff.

Shoreline Erosion. Some shoreline erosion has been observed along the sound side of the park. The rate of erosion is unknown, but it is generally a natural process resulting from rising sea levels. The shoreline should be monitored.

Vegetation Damage. Heavy foot traffic has trampled vegetation at the crosswalk at US 158, and unauthorized off-road vehicles have damaged vegetation along the sound side of the park. Unauthorized vehicles should be kept out of the park.

Cultural Resources. Limited archaeological work in the park has identified at least two archaeological sites, both located on the sound side. Both historic and prehistoric remains have been found. Additional investigations along the sound would undoubtedly identify old house foundations, refuse pits, privies, wells, and other remains. Shifting sands and erosion cover and uncover these remains over time.

Resource Management Plan. A resource management plan for the park needs to be developed to address these issues and other resource management issues. A resource management plan should include detailed alternative actions and their implementation to address, prevent or correct the different resource threats or issues. The addition of district resource management specialists would enable park resource management plans to be done.

VII. PHYSICAL PLANT INVENTORY

FACILITY INVENTORY AND INSPECTION PROGRAM

The buildings in state parks are needed for park operations and visitor services. These buildings and facilities are essential components of protecting the public's health and safety. They include facilities providing safe drinking water, restrooms, and electricity, as well as recreation facilities such as bathhouses, group camps, and cabins. Without proper maintenance, these facilities are, at best, a disservice to the citizens who use them, and at worst, potentially harmful.

The Facility Inventory and Inspection Program (FIIP) is a computer-based system used to track the condition, maintenance needs, and repair costs of every building in the state parks system. A principal objective of FIIP is to identify deficiencies that may affect health, fire, or life safety. Other objectives are to identify accessibility deficiencies and other significant maintenance-related deficiencies.

During a field evaluation of each facility, deficiencies are given priority ratings of critical, serious, or minor. The deficiencies are classified in nine basic categories: site (the grounds and walkways surrounding the building); exterior envelope; interior envelope; fire/life safety; handicapped accessibility; public health; heating/ventilation/air conditioning (HVAC); plumbing; and electrical.

The field evaluation begins with an inventory of all structures in the park. The results of the inventory are presented using the building name and state property numbers as identification. Next, the types of repairs and repair costs are listed for each building. Finally, the cost summary for the park is given using the nine basic categories of repairs (e.g. exterior envelope) and the three levels of deficiencies (critical, serious, and minor).

JOCKEY'S RIDGE STATE PARK BUILDING INVENTORY

<u>CODE</u>	<u>BUILDING NAME</u>	<u>IN USE</u>
030001	Office, Maintenance & Exhibit Bldg.	Y
030002	Public Restrooms	Y
030003	Picnic Shelter	Y
030004	Picnic Shelter	Y
030005	Picnic Shelter	Y
030006	Picnic Shelter	Y
030007	Picnic Shelter	Y
030008	Picnic Shelter	Y
030009	Picnic Shelter	Y
030010	Picnic Shelter	Y
030012	Park Residence	Y

030013	Guessford House	Y
030014	Morlino House	Y
030015	Layton House	N
030016	Hollowell House	Y
030017	Linwood Proctor House	Y
030018	Nellie Proctor House	N
030019	Willoughby House	N
030020	Midgett-Mann House -- Demolished	N

FACILITIES INSPECTION AND IMPROVEMENT

The buildings at Jockey's Ridge are mostly in fair condition: structurally sound, but needing repairs. The work required will bring them to minimum standards so they can remain in service until replacements can be built in 5 to 10 years. Most of the residences and the seasonal barracks fall into this category and require work totalling over \$10,000 each. Building 012, a park residence, also fits this description, but the total work cost is less than \$10,000.

The only public building that needs major work is the public restroom (002). Other public buildings, including the office/museum and the picnic shelters, are in good condition and require little or no work.

Three buildings are noted for demolition (015, 019, and 020). The Midgett-Mann House (020) has actually already burned, but the ruins remain, so money is allocated for site cleanup. Buildings 015 and 019 are in very poor condition and are not needed.

Handicapped Accessibility: Only one building shows deficiencies in handicapped accessibility: the public restrooms building (# 002) needs a striped crosswalk from the parking lot to the sidewalk access and needs an accessible drinking fountain, for a total cost of \$1,075. All other buildings met accessibility requirements at the time of inspection. In addition, a walkway/ramp system has been constructed from the sidewalk at the public restrooms to a viewing platform overlooking the dunes.

<u>Bldg#</u>	<u>Building Name/Need</u>	<u>Demolition Cost</u>	<u>Repair Cost</u>
030-002	<u>Public Restrooms</u>		\$ 22,812
	Replace broken water closets		1,508
	Crossing stripes - parking lot to H/A access		75
	Replace drinking fountain		1,000
	Quarry tile floors, ceramic tile walls to 4', restrain wall above tile, new partitions		16,815
	Replace incandescent lights with fluorescent		639
	Add soffit vents and attic fan		1,875

<u>Bldg#</u>	<u>Building Name/Need</u>	<u>Demolition Cost</u>	<u>Repair Cost</u>
	Add 5' X 9' storage area		840
	Sidewalk on border of parking area		60
030-003 through 030-010	<u>Picnic Shelters</u> Paint all - cost \$450 each		3,600
030-012	<u>Park Residence</u> Replace carpet		8,370 2,963
	Replace garage door when required (est.'93)		1,207
	Add rear deck with rails, bencher		4,200
030-013	<u>Guessford House</u> Renovate as required for use as temporary seasonal barracks. Work to include roofing, septic system and foundation repairs		22,475
030-014	<u>Morlino House</u> Add weather strip to bottom of door; replace screen door.		12,155 173
	Rebuild wood stairs to screened porch.		68
	Replace vinyl flooring & Formica in kitchen		783
	Staff remove unused underground fuel storage tank		0
	Clean mildew off porch ceiling, repaint all exterior		1,131
	Further renovations to bring residence up to standard, including carpet		10,000
030-015	<u>Layton House</u>	4,500	
030-016	<u>Hollowell House</u> Renovate as required for use as temporary seasonal barracks. Work to include electrical repairs and repainting.		15,000
030-017	<u>Linwood Proctor House</u> Add attic insulation		20,439 918
	Repair roof & replace roofing		4,275
	Provide gravel drive for Bldgs 015, 016,017,& 018 and parking for 017		15,141
	Add exit light at steps		105
030-019	<u>Willoughby House</u>	3,000	
030-020	<u>Midgett-Mann House</u>	4,500	
	TOTALS	\$ 12,000	\$ 104,851

FACILITY REPAIR NEEDS COST SUMMARY

<u>DEFICIENCY CATEGORY</u>	<u>PRIORITY 1 (CRITICAL)</u>	<u>PRIORITY 2 (SERIOUS)</u>	<u>PRIORITY 3 (MINOR)</u>	<u>CATEGORY SUBTOTAL</u>
SITE	4500	68541	0	73041
EXTERIOR ENVELOPE	0	4608	14339	18947
INTERIOR ENVELOPE	0	15222	5340	20562
FIRE/LIFE SAFETY	0	105	0	105
HANDICAPPED ACCESS	0	1075	0	1075
PUBLIC HEALTH	0	0	0	0
HVAC	0	975	0	975
PLUMBING/UTILITY	1508	0	0	1508
ELECTRICAL	0	639	0	639
=====	6008	91165	19679	116851

Deficiencies that are a threat to fire and life safety or the health of an individual are considered to be "critical." A "serious" deficiency is one that is not considered a threat to fire and life safety, but which could cause further damage to the structure if left uncorrected. This category usually includes building code violations. "Minor" deficiencies are those requiring general maintenance and repair.

ROAD & UTILITY INVENTORY

This inventory gives a brief description of the existing park infrastructure (roads, water, sewer, electrical and telephones) and makes general recommendations for upgrading and maintaining these systems. The information for this report was obtained through telephone conversations with the superintendent and from site visits to the park. Other information comes from the Institute for Transportation Research and Education (ITRE) study on roads and parking lots and from original construction drawings.

Jockey's Ridge is a relatively new park, with the majority of the park infrastructure having been built in the late 1970's and early 1980's. The majority of this construction is in fair to good condition. Some of the acquired private residences have problems.

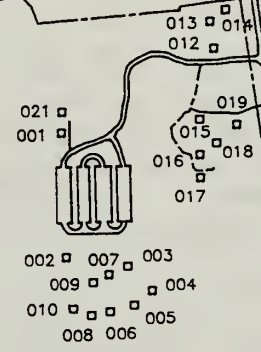
JOCKEY'S RIDGE STATE PARK BUILDING LOCATIONS



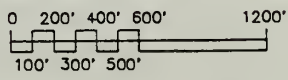
ROANOKE SOUND

VILLA DUNES DRIVE

U.S. 158 BYPASS



GRAPHIC SCALE



SOUND SIDE ROAD S.R. 1221

The inventory is divided into five sections: roads and parking areas; sewer system; water system; electrical system; and telephone system. Each section is broken into two parts: existing conditions and recommendations for repair.

EXISTING CONDITIONS - ROADS AND PARKING AREAS

According to the Institute for Transportation Research and Education (ITRE) Study completed in March 1990, there are .58 miles of paved roads and 5,295 square yards of paved parking lot. Although the overall condition of the roads and parking lots is good, the ITRE study recommends \$1,952 of road maintenance in the park. The majority of this is for line striping and some pavement patching.

Approximately \$500 was spent on roadway maintenance for the year 1990-91 under the Division's current agreement with the N.C. Department of Transportation. Another \$500 is obligated for fiscal year 1991-92.

The roads and parking lots are in need of paint striping and the road needs an edge line stripe. Bermuda grass is beginning to grow through the pavement in several locations. Road shoulders have built up above the pavement level in several locations due to sand movement. Road pavement shows some slight to moderate raveling, and some reflective cracking is beginning to take place as well.

A deceleration lane has recently been completed in the southbound lane of U.S. 158 Bypass and will provide easier and safer park access. A new park entrance sign has been installed by Friends of Jockey's Ridge.

A 23-car asphalt parking area is located along the Soundside Road. There are no plans to expand this area, which is operated under a memorandum of agreement by the Town of Nags Head.

RECOMMENDATIONS FOR ROADS AND PARKING AREAS

1. The existing annual service agreement with the N.C. Department of Transportation (DOT) is adequate for maintenance of the park roads.
2. The Bermuda grass needs to be sprayed with the herbicide Round-up to prevent further pavement damage. N.C. DOT could perform this service.
3. The excess shoulder material should be removed by N.C. DOT maintenance personnel.
4. The Division should request that DOT study the need to add a traffic light at the entrance to Jockey's Ridge. Such a light may be desirable, particularly during the peak season.

EXISTING CONDITIONS - SEWER SYSTEMS

All buildings with toilet facilities have their own septic tanks with nitrification lines.

The main toilet building at the south end of the parking lot has a 6,000-gallon septic tank with a 600-gallon dual siphon dosing tank. The sewer drainfield has 12 lines, 110 feet long. The system was installed in 1980 and appears to be working satisfactorily.

The office and shop are served by a 900-gallon septic tank with three 80-foot drain lines. There is no inspection riser on the septic tank. This system was installed in 1983 and appears to be in good shape. The Town of Nags Head has installed a Porta-John at the estuarine access area.

There are five residences within the park. These were acquired over the years with land acquisition funds. Two of the houses have been converted into personnel barracks and temporary housing. All have septic tanks of unknown capacity; most are probably 900 to 1,000 gallons in size. The system at Guessford House is the only one that has experienced problems; it needs new drainlines and probably a new tank.

RECOMMENDATIONS FOR THE SEWER SYSTEMS

1. Replace drainfield and tank at Guessford House (#030013). Estimated cost is \$3,000.
2. Pump out septic tank at the other four houses and office. Install risers for access. Estimated cost for five tanks at \$500 each = \$2,500.
3. The 6,000-gallon tank needs to be checked for proper dosing and for cleaning. Estimated cost is \$500.
4. The superintendent's residence (#17) kitchen has a separate septic tank from the main tank. The kitchen septic does not work, and the kitchen drains need connecting to the main septic. Estimated cost is \$500.

EXISTING CONDITIONS - WATER SYSTEM

The park is supplied water by the Town of Nags Head. A 4-inch PVC main waterline ties into an existing 8-inch main waterline at the park entrance. The 4-inch main then runs along the right side of the main park road to a valve box at the intersection of the parking lot road. It then splits and a 3-inch PVC runs along the parking lot to the toilet building. A 2-inch line splits off at the 4-inch pipe and supplies the office and maintenance complex. There is a total length of approximately 2,120 feet of waterline, all PVC and all installed in 1982.

The Town of Nags Head also supplies water along the access entrance to the estuarine site and north to the vicinity of the burned cottage (Mann cottage). The five residences are also on the City of Nags Head water supply. They are supplied with 1-inch service connections.

RECOMMENDATIONS FOR THE WATER SYSTEM

1. There are no problems with the present distribution system. The valves will require periodic maintenance and replacement within the next five years.

EXISTING CONDITIONS - ELECTRICAL DISTRIBUTION SYSTEM

The park is supplied by an underground electrical power distribution system provided by the North Carolina Power Company (formerly the Virginia Electric Power Company or VEPCO). The power company is responsible for maintenance and replacement.

The five residences are supplied by overhead power. It would be desirable to change to underground power.

RECOMMENDATIONS FOR ELECTRICAL SYSTEM

1. The main distribution system will be maintained and upgraded by North Carolina Power Company.
2. The main transmission lines on the sound side of the park need to be buried, primarily for safety but also for aesthetic reasons. The transmission lines are close to the dune height now. Estimated cost is \$169,634.
3. Power to the ranger residences needs to be installed underground both for aesthetic considerations and for protection from damaging winds. The estimated cost is approximately \$5,000.

EXISTING CONDITIONS - TELEPHONE SYSTEM

The telephone service is provided and owned by Carolina Telephone Company. There are two telephones in the office and maintenance area. The three residences also have telephone service. A pay phone is available at the park office for use by the general public.

RECOMMENDATIONS FOR THE TELEPHONE SYSTEM

The park should request that a pay telephone from the telephone company be located at the estuarine access area, the cost to be

shared by the telephone company and the park. The rest of the telephone system is maintained by Carolina Telephone.

SUMMARY

Overall the park's roads are in good shape. Residential sewer systems need repair and upgrading and some electrical lines need to be buried for safety and aesthetic reasons. With proper maintenance the infrastructure should last many more years. The parking lot and road system are beginning to become stressed due to the heavy traffic volume and corrosive wind and sand. The roads and parking areas will have to be resurfaced within five years.

MAJOR CAPITAL IMPROVEMENT PROJECT PRIORITIES

The Jockey's Ridge State Park Master Plan describes the long-range vision of what the park should be. A significant portion of the master plan is devoted to identifying short- and long-term development plans for the park. The development plans are to be implemented by identifying and detailing specific capital improvement projects that can be constructed through the state construction process. By identifying, evaluating and ranking each development project, the Division has created a priority list of capital improvement projects for each park and for the state parks system. The Jockey's Ridge State Park project ranking is based upon objectives such as promoting public health, protecting natural resources, enhancing environmental education, increasing public accessibility, and improving the park's appearance.

As a part of the general management plan process, the master plan with its proposed development was carefully reviewed to determine if changes were needed. Such a review had not been undertaken since the master plan was published in 1976. Changes in development plans were deemed necessary. The original development project list, recommended changes to that list, and the revised project list follow.

In reviewing master plan capital improvement recommendations, the general management plan evaluation team considered factors such as changes in environmental regulations, condition of facilities, natural heritage inventory, changes in recreation demand, park visitor safety considerations, State Parks Act stipulations, and current recreation demand. This review of proposed capital improvements resulted in changes, additions, and deletions to capital improvement proposals.

PRE-GMP PROJECT PRIORITY LIST (1990)

Rank	Description	Mean Score	Total Costs
1.	Repair parking area	521	\$ 192,000
2.	Demolish buildings	500	75,000
3.	Landscape park	472	75,000
4.	Visitor center/concession bldg.	460	1,250,000
5.	Build warehouse, pave maintenance lot	414	110,360
6.	Renovate ranger residences (2)	383	141,700
			=====
TOTAL:			\$1,844,060

RECOMMENDED CHANGES TO PROJECT PRIORITY LIST

Projects to be Deleted

1. Repair of parking area (\$192,000): DOT will pave the lot per DOT agreement. Wheel stops will be included in the landscape project.
2. Visitor Center/Concession Building (\$1,250,000): This project will be split into two separate projects with the concession portion given higher priority. The new museum/exhibit space will be a part of the new visitors center/office.

Projects with Changed Scopes

1. Building demolition (\$27,100): The scope of this project will be reduced. Three structures are to be demolished immediately, and the demolition of the others will be postponed until new replacement structures can be provided.
2. Landscape improvements project (\$84,900): This project will be expanded to include parking lot wheelstops, Soundside Road dune stabilization, and entrance improvements.
3. Maintenance area improvements (\$188,300): A five-bay vehicular storage area and a flammable storage building are being added to the maintenance area project. The museum and office building will be renovated to function as both the warehouse space and maintenance office. The area will be fenced for security. The gravel lot behind the existing office/maintenance center will be paved.
4. Park housing needs (\$368,100): This project will upgrade park housing by building two needed residences and converting two existing residences into barracks until new barracks can be provided. The project also demolishes current buildings that are used as barracks. All existing park housing is inadequate

and standards need to be improved.

Projects Proposed to be Added to List

1. Barracks (\$257,700): Two existing houses are substandard but will be used until new seasonal housing can be provided in one structure.
2. Sewer/electric utilities renovations (\$251,500): This project will upgrade sewer systems in buildings that were bought with property and place all electric lines underground.
3. Visitor center (\$446,200): This project has been separated from the concession building project because of the lower priority of the new park office. Maintenance area improvements will take over existing office space. Museum/exhibit space will be included with visitor center/office.
4. Concession building (\$434,900): This project has been split from the combination building with visitor center. The building includes a concession area, lookout tower, sales, repair, instruction and restroom functions.
5. Building renovations (\$137,900): This project includes minimum FIIP building repairs needed to stabilize existing buildings until new structures can be provided.

REVISED PROJECT PRIORITY LIST (9/8/92)

Rank	Description	*Mean Score	Total Costs
1.	Concession building	537	\$ 434,900
2.	Sewer/elec. utilities renovations	530	251,500
3.	Demolish bldgs.	504	27,100
4.	Landscape improvements	480	84,900
5.	Visitor center	473	446,200
6.	Barracks	447	257,700
7.	Building renovations	446	137,900
8.	Maintenance area improvements	426	188,300
9.	Park housing needs	425	368,100
			=====
TOTAL:			\$2,196,600

* The mean score comes from the Division's Project Evaluation Program (PEP). The PEP uses an evaluation formula to rank projects that considers three factors: the objective of the project; the justification or urgency for funding; and the estimated annual number of persons (visitors and/or employees) who are affected by the project. Projects are evaluated by the park superintendent, district superintendent, and Division management.

VIII. VISITOR SERVICES AND PARK OPERATIONS

VISITOR FACILITIES

Visitor facilities at Jockey's Ridge State Park provide opportunities for hiking, environmental education, playing in the sand, picnicking, kite flying and hand gliding. Access to Roanoke Sound is also provided. The picnic area provides eight shelters spaced among small dunes with low-growing vegetation. Each shelter has two tables and grills, and drinking water and restrooms are nearby. The town of Nags Head provides an estuarine access area with parking under a memorandum of understanding with the Division.

OPERATIONS EVALUATION

The major issues concerning the park are identified by Division of Parks and Recreation staff at the initiation of the general management planning process. These issues are classified into three main categories: natural resources, capital improvements, and operations. This chapter deals with the park operations issues and recommendations.

Jockey's Ridge has been assisted considerably in recent years by park support groups. The Friends of Jockey's Ridge have raised approximately \$14,000 for new entrance signs and interpretive and education materials and programs. This group also established the 1.5-mile self-guided nature trail. The Junior Friends of Jockey's Ridge obtained approximately \$12,000 in grants to construct a boardwalk in the park, work accomplished with over 600 hours in donated labor.

Four major operations/management issues have been identified as being of significant concern at Jockey's Ridge State Park. These issues are: (1) staffing deficiencies; (2) interpretive program potential; (3) visitor access control, and (4) location of the hang-gliding concession. Discussion of these issues follows.

STAFFING DEFICIENCIES

Insufficient staff is available to serve the public. The office, which the public expects to be open during normal business hours and weekends, is inadequately staffed. Park rangers are often called upon to answer the phones or choose to leave the office unattended.

Minimum park operation hours are 8 a.m. to 6 p.m., seven days a week, thus requiring the gate to be open and the office staffed at least 70 hours per week. During the summer peak season, park hours

expand to 91 hours weekly. To adequately staff the office and serve the public, a full-time clerk, in addition to the existing nine-month peak-load clerk, is needed to cover an additional two days per week. Other staff needs include seasonal ranger, general utility worker, and naturalist positions.

Each ranger is currently spending about 25 percent of his/her work time in the park office answering the telephone, writing hang gliding permits, and handling other clerical duties, such as typing program materials and reports and answering basic visitor questions. Addition of a permanent clerical position to handle these duties would allow existing staff to spend additional time on ranger duties such as interpretation and education and public safety.

With the high level of visitation, a seasonal general utility worker is also a needed addition to park staffing. Restrooms constantly need cleaning and stocking as a result of their heavy use. A seasonal general utility worker could also assist with cleaning of the soundside access and mowing of grassy areas.

The addition of a seasonal ranger and seasonal naturalist would allow needed staff to be available during the peak season. Two or three staff persons need to be on duty in the evenings when 2,000 to 3,000 people visit.

INTERPRETIVE PROGRAM POTENTIAL

Jockey's Ridge State Park has a very high seasonal visitation because of the large number of tourists that visit the Outer Banks during the summer season. With summer visitation typically ranging from 3,000 to 4,000 -- and sometimes as high as 7,000 -- daily, excellent chances exist for expansion of the Division's existing interpretation and education activities.

Currently there are 10 children's interpretation and education classes offered each week during the summer. The classes are usually full. Reservations are required and there is a long waiting list for available openings. More programs are needed in order to meet public demand.

Park staff and volunteers currently give 260 programs annually, interacting with 19,188 visitors during the programs. In the peak season, staff are so busy interacting with visitors, they have insufficient time to perform other ranger duties. Too many people are currently being turned away from formal programs, especially the children's programs. The seasonal demand on present staff is overwhelming, and public needs are not being met. Some of the current interpretive programs need to be evaluated to determine if they could be adapted to allow self-guided tours.

The addition of a permanent clerical position (discussed previously under staffing deficiencies) would allow rangers to offer more

programs. In addition, one three-month seasonal assistant and a seasonal naturalist would help meet demand for more programs. Additional staff could also be used to recruit, train and supervise more volunteers.

Table VIII-1. Existing and Proposed Staff

<u>Existing</u>	<u>Proposed Additional Staff</u>
1 superintendent	1 clerk
2 rangers	1 seasonal assistant ranger
1 maintenance mechanic	1 seasonal general utility worker
1 seasonal park attendant	1 seasonal naturalist
1 peak load clerk	
1 peak load park attendant	

CROSSWALK ACCESS

The pedestrian crosswalk on Highway 158 is a major problem. It creates visitor use conflicts and safety hazards. The crosswalk is associated with the hang-gliding concession and kite shop located across the highway from the park. The park superintendent estimates that between 1000 and 1600 persons may use the crosswalk daily during the peak summer season. Some of this use takes place at night after park operating hours. On many nights, visitors get lost by following other park visitors to the concession area, mistaking that area for the park's parking area.

Annual average daily vehicle traffic near Jockey's Ridge on the Highway 158 bypass is approximately 32,000 vehicles daily. Because the area serves as a major tourist attraction, traffic volume in the summer season is much greater than in the off season. Monthly traffic figures are not kept by the Department of Transportation for the location near Jockey's Ridge. Using the nearest station where average daily traffic is kept by month as an indicator (on U.S. 158 east of the Currituck Sound bridge) and from conversations with DOT personnel, it is reasonable to expect that daily traffic by Jockey's Ridge during the summer season would be two to three times the annual average daily traffic of 32,000. Unfortunately, the rise in daily traffic and use of the crosswalk increase together during the summer season.

The very existence of a crosswalk on a major by-pass presents traffic hazards and threats to public safety. Additionally, the "front dune" area of the park near the Highway 158 bypass is suffering resource damage associated with pedestrian access to the park at this location. The low dunes there have been flattened and vegetation damaged by foot traffic.

The various activities associated with the park -- hang gliding, kite flying, dune climbing, etc. -- constitute a distraction to motorists on Highway 158. Incidents such as motorists failing to stop for the crosswalk traffic light have occurred. The Division safety officer has concluded that the existing pedestrian crosswalk creates visitor use conflicts and safety hazards. Additionally, local citizens frequently complain about the crosswalk and the stopping of traffic.

Because of the above-described existing situation, the consensus of the Division staff is that the crosswalk and traffic light should be removed and access along the Highway 158 bypass limited to the main park entrance. Such an action should be timed to coincide with relocation of the hang-gliding concession within the park, thereby greatly reducing the need for pedestrian access via a crosswalk.

RELOCATION OF HANG-GLIDING CONCESSION

The Jockey's Ridge State Park master plan calls for location of the hang-gliding concession within the park. During general management plan meetings, Division staff discussed and reconfirmed the desirability of constructing an appropriate building within the park to house the hang-gliding concession.

The benefits of relocating the concession within the park include improved management of the concessionaire's operations, visitor convenience and safety, and reduction of visitor conflicts. With the concession located in the park, visitors would be more likely to use other park facilities, such as the museum, picnic area, nature trail, and interpretive and education programs. Relocation of the concession within the park would also allow a fairer bidding process and ultimately a higher percentage of the concession revenue. Moving the hang-gliding concession into the park would also greatly reduce the need for the crosswalk at the Highway 158 bypass.

Much of the pedestrian use of the crosswalk is currently associated with the concession operations. By shifting the concession into the park, most of the safety problems resulting from the conflict between pedestrians and vehicle traffic of Highway 158 would be eliminated. Complaints related to the backup of traffic at the crosswalk during the summer season would also be eliminated.

Elimination of the crosswalk would result in the park having one main entrance, as was originally called for in the park's master plan. Having the one main entrance would also allow for more frequent contact between park staff and park users. More park users would visit the park office and museum as well as be able to obtain information about park programs. Some visitors using the crosswalk as an entrance visit the park without even being aware that it is a state park.

With two primary entrances currently in use, frequent conflicts occur when pedestrians walk into hang-gliding areas. The hang-gliding kites are large devices, and a person struck by one could sustain moderate to severe injuries, as has happened in the past. Using one main park entrance for pedestrian use would eliminate much of this problem.

It is obvious that elimination of the crosswalk will not eliminate pedestrian access. Due to the park's setting, pedestrians will continue to enter the park through various points along its boundary. Elimination of the crosswalk, if timed with relocation of the hang-gliding concession, would eliminate most of the public safety problems currently existing between pedestrians and vehicular traffic and hang-gliders. Additional signs noting the park's formal access point should be added when the concession is relocated.

The N.C. Department of Transportation will be asked to study the need to add a traffic light at the entrance to Jockey's Ridge. If installed, pedestrian access from the ocean side of Jockey's Ridge at this location would be made safer.

The concession is the biggest problem for park staff. The Division has continually been faced with violations of the concessionaire's agreement by the concessionaire. Moving the hang-gliding concession into the park should improve oversight of the agreement and create a closer and better working relationship between park staff and the concessionaire. Concessionaire violations have included use of wrong dunes for take-off, hang-gliding after closing hours, too many hang-gliders, event advertising prior to park approval, and no radio for maintaining communication with park staff.

IX. LAND ACQUISITION NEEDS

LAND ACQUISITION STATUS

Jockey's Ridge State Park contains 414 acres. It was included in the 1985 appropriation for state park land acquisition, and 30 acres were acquired in this program. One condemnation case has been settled. Two condemnation cases are currently being litigated.

FUTURE LAND ACQUISITION NEEDS

To complete the master plan for Jockey's Ridge State Park would require the acquisition of six acres. Past land acquisition priorities have included the acquisition of soundside inholdings, inholdings along US 158, and lots along Soundside Road where sand mining has occurred.

Remaining lots along Soundside Road should be added to the master-planned boundary for Jockey's Ridge State Park. The shifting sands often migrate onto the land between the existing park boundary and Soundside Road. The area involved in this addition is approximately 10 acres. The acquisition of these lots should occur on a willing-seller basis as funding allows.

LAND ACQUISITION SUMMARY TABLE

1985 size of the park	384 acres
1985 land program additions	<u>30 acres</u>
Current size of park	414 acres
Master planned needs	<u>6 acres</u>
Master planned size of the park	420 acres
Additions to planned needs	<u>10 acres</u>
Revised planned size of the park	430 acres

JOCKEY'S RIDGE
STATE PARK

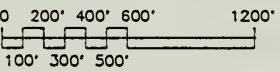


ROANOKE SOUND




VILLA DUNES DRIVE

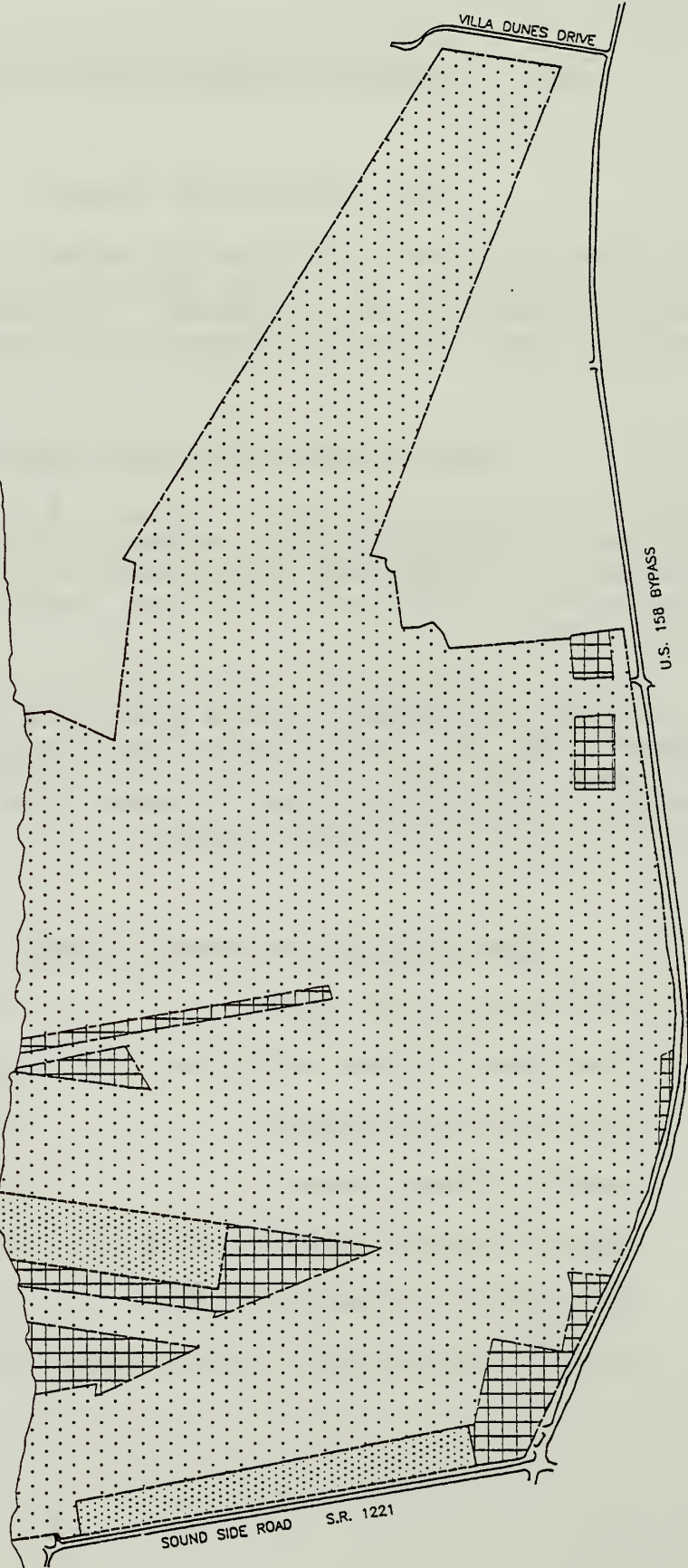
U.S. 158 BYPASS

GRAPHIC SCALE



LEGEND

-  PARK-1985
-  ACQUIRED SINCE 1985
-  FUTURE NEEDS



APPENDIX A

PARK PROFILE

JOCKEY'S RIDGE

PARK PROFILE

Location: Dare County

Size: 414 Acres

Established: 1975

Facilities:

- Park Office/Museum
- Picnic Area (8 shelters, each with 2 tables and a grill)
- Restroom
- Hiking Trail
- Estuarine access area
- Boardwalk with overlook

Existing Staff:

- 1 Superintendent
- 2 Rangers
- 1 Maintenance Mechanic
- 1 Seasonal Park Attendant
- 1 Peak Load Clerk
- 1 Peak Load Park Attendant

Statistics:

	<u>Fiscal 1991</u>
Visitation (calendar)	656,212
Operating Budget	125,403
Revenue	41,390

APPENDIX B

CAPITAL IMPROVEMENT REQUESTS

SEP 8, 92

Projects By Park In Priority Order

Job Description	Job Codes	Dst Cde	Locations	Mean Score	Total Costs
Concession building	116N30	2	EAS Jockeys Ridge	589	\$ 434,900
Sewer/electric utilities renovations	610R30	1	EAS Jockeys Ridge	538	\$ 251,500
Demolish bldgs.	510R30	5	EAS Jockeys Ridge	530	\$ 27,100
Landscape improvements	10N30	3	EAS Jockeys Ridge	480	\$ 84,900
Visitor center	116N30	1	EAS Jockeys Ridge	472	\$ 446,200
Barracks	100N30	1	EAS Jockeys Ridge	464	\$ 257,700
Building renovations	530R30	1	EAS Jockeys Ridge	449	\$ 137,900
Maintenance area improvements	148N30	1	EAS Jockeys Ridge	426	\$ 188,300
Park housing needs	300N30	1	EAS Jockeys Ridge	425	\$ 368,100

					\$ 2,196,600

					\$ 2,196,600

Total number of jobs reported = 9



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